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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,033	01/16/2004	Clive K. Tang	873.0135.U1(US)	8506
29683	7590	08/10/2005	EXAMINER	
HARRINGTON & SMITH, LLP 4 RESEARCH DRIVE SHELTON, CT 06484-6212			MURPHY, RHONDA L	
			ART UNIT	PAPER NUMBER
			2667	

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/760,033	Applicant(s) TANG ET AL.	
	Examiner Rhonda Murphy	Art Unit 2667	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11, 12, 19-26, 29, 30 and 41-52 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-6, 9, 19-21, 23-24, 30, 41-45, 47-48, 51 is/are rejected.
- 7) ☒ Claim(s) 4, 7, 8, 11, 12, 22, 25, 26, 29, 46, 49, 50 and 52 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/16/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because of a typographical error on the second line of paragraph 125. The period after the word "system" shall be replaced with a comma. Correction is required. See MPEP § 608.01(b).
2. The disclosure is objected to because of the following typographical error: On page 9, paragraph 37, "120-1" and "120-m" shall be replaced with "170-1" and "170-m", according to the elements shown in figure 2.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 5-6, 9, 19-21, 23-24, 30, 41-45, 47-48 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Olszewski (US 2003/0223354) in view of Maltsev et al. (US 2005/0152466).

Regarding claims 1 and 19, Olszewski teaches a method of transmitting data in a wireless MC-CDMA system to a set of M users comprising the steps of: providing a transmitter system with N sub-carriers divided into G groups (page 3, paragraph, paragraph 29; groupings of sub-channel signals), N and G being integers (the number

of sub-carriers and groups must be integer values in order to be evenly divisible); determining an instantaneous group SNR that is calculated using an effective channel function for each user in each group of sub-carriers (page 6, paragraph 93; SINR measurements computed for groups of sub-channel signals; page 5, paragraph 72; quantized measurement of SINR for sub-channel group $G_i[n]$ in $G[n]$).

Although Olszewski teaches an instantaneous SNR of an equivalent single sub-carrier (page 5, paragraph 72), Olszewski fails to explicitly disclose using the instantaneous SNR of an equivalent single sub-carrier as a metric for resource allocation at the transmitter.

However, Maltsev teaches, for each user and in each group of sub-carriers, using power of a single sub-carrier as a metric for resource allocation at the transmitter (page 3, paragraph 29).

In view of this, it would have been obvious to one skilled in the art to modify Olszewski's method, by utilizing the power of a sub-carrier as a metric for resource allocation, for the purpose of increasing or decreasing the power level in order to optimize channel capacity.

Regarding claims 2, 20 and 44, Olszewski teaches at least one MC-CDMA receiver for receiving data using an instantaneous SNR of an equivalent single sub-carrier (page 3, paragraph 31; page 5, paragraph 72); and a demodulator for demodulating the received data (page 3, paragraph 31).

Olszewski fails to explicitly disclose using the instantaneous SNR of an equivalent single sub-carrier as a metric for resource allocation.

However, Maltsev teaches, for each user and in each group of sub-carriers, using power of a single sub-carrier as a metric for resource allocation at the transmitter (page 3, paragraph 29).

In view of this, it would have been obvious to one skilled in the art to modify Olszewski's method, by utilizing the power of a sub-carrier as a metric for resource allocation, for the purpose of increasing or decreasing the power level in order to optimize channel capacity. Furthermore, it would have been obvious to for the demodulator to correspond to the allocated resources for demodulating the received data, in order to properly demodulate and recover the received data.

Regarding claims 3 and 45, Olszewski further teaches user data bits are modulated with a modulation scheme corresponding to that user's group SNR (page 5, paragraph 92) and spread in frequency over said sub-carriers belonging to that user's group (page 5, paragraph 92).

Regarding claims 5 and 47, Olszewski teaches determining the instantaneous group SNR of the user's group of sub-carriers.

Olszewski fails to explicitly disclose calculating bit and power allocation for each equivalent sub-carrier and modulating each equivalent sub-carrier with a corresponding number of data bits, corresponding to the user's group SNR. However, calculation of bit

and power allocation, as well as bit modulation is known in the art for maximizing channel capacity.

Furthermore, Maltsev teaches calculating bit and power allocation for each sub-carrier (page 1, paragraph 13; Fig. 3) and modulating each sub-carrier with a corresponding number of data bits, corresponding to the user's group SNR (page 4, paragraph 44).

In view of this, it would have been obvious to one skilled in the art to modify Olszewski's method by including the calculation of bit and power allocation, as well as modulation with the corresponding number of data bits for each user's group SNR, for the purpose of adjusting the data rate to optimize channel capacity.

Regarding claims 6 and 48, Olszewski further teaches, for each user and in each group of sub-carriers, regarding the instantaneous group SNR as the instantaneous SNR of an equivalent single sub-carrier to the group (page 5, paragraph 72; quantized measurement of SINR for sub-channel group $G_i[n]$ in $G[n]$).

Regarding claims 9 and 51, Olszewski further teaches user data bits for each user in each group of modulated sub-carriers are modulated by a modulation scheme corresponding to the user's group SNR (page 6, paragraph 97), then spread with a spreading code associated with that user (page 6, paragraph 99), and loaded into the sub-carriers of the user's group (page 6, paragraph 97).

Regarding claim 21, Olszewski further teaches a transmitter in which the modulator modulates data bits with a modulation scheme corresponding to said group SNR (page

5, paragraph 92), and the transmitter further comprising a spreader for spreading the unmodulated data bits in frequency over said sub-carriers belonging to said group (it is known in the art that spreaders spread unmodulated data bits over sub-carriers).

Regarding claim 23, the combined method of Olszewski and Maltsev teach the same limitations described in claim 5. Additionally, the process of calculating bits and power allocation inherently includes calculating circuitry.

Regarding claim 24, the combined method of Olszewski and Maltsev teach the same limitations described in claim 6. Additionally, the process of calculating inherently includes calculating circuitry.

Regarding claim 30, Olszewski teaches the circuitry for calculating further calculating, for each user, said effective channel function and said group SNR of the sub-carriers in said effective channel function (page 5, paragraph 72).

Regarding claim 41, Olszewski teaches a transmitter disposed in a mobile station (page 6, paragraph 97). Furthermore, it is known in the art that transmitters are disposed in mobile stations.

Regarding claim 42, Olszewski teaches a transmitter disposed in a base station of a cellular communication system (page 6, paragraph 97). Furthermore, it is known in the art that transmitters are disposed in a base stations.

Regarding claim 43, the combined method of Olszewski and Maltsev teach the same limitations described in claims 1 and 19. Furthermore, Olszewski teaches a program of

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machine-readable instructions, tangibly embodied on an information bearing medium and executable by a digital data processor, to perform actions directed toward transmitting data in a wireless multi-carrier spread spectrum communication system (page 6, paragraph 93; software within a programmable digital signal processor

Allowable Subject Matter

5. Claims 4, 7,8, 11,12, 22, 25, 26, 29,46,49, 50 and 52 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

* Maltsev et al. (US 2005/0031047) discloses an adaptive multicarrier wireless communication system, apparatus and associated methods.

* Wu et al. (US 2005/0063345) discloses a system and method for embedding OFDM in CDMA systems.

* Catreux-Erceg et al. (US 2005/0090205) discloses a system and method for channel-adaptive antenna selection.

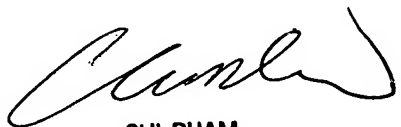
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rhonda Murphy whose telephone number is (571) 272-3185. The examiner can normally be reached on Monday - Friday 8:00 - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (571) 272-3179. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rhonda Murphy
Examiner
Art Unit 2667

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